

**CLAIMS**

1. Device for testing at least one sample by optical detection of luminescence, comprising a site for receiving the sample, said site being arranged in such a way that the sample can receive a luminescence excitation and emit a luminescence light in an optical guiding plane of the device, the device further comprising collection means optically connected to the optical guiding plane for collecting the luminescence light, wherein the device further comprises, in the optical guiding plane, means making it possible to send back towards the collection means a part of the luminescence light emitted in the optical guiding plane and not directly collected by the collection means.

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2. Test device according to claim 1, wherein it further supports means of detecting the luminescence light, the detection means being arranged at the output of the collection means.

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3. Test device according to claim 2, wherein the device being formed on a substrate, the optical guiding plane is a plane parallel to the substrate and the luminescence light detection means are arranged along a plane perpendicular to said plane parallel to the substrate.

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4. Test device according to claim 1, wherein the means making it possible to send back a part of the luminescence light towards the collection means are chosen among: an elliptic mirror, a parabolic mirror, a photonic

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forbidden band structure, a resonating disc type structure and one or several focusing lenses.

5           5. Test device according to claim 1, wherein the collection means comprise at least one optical waveguide.

          6. Test device according to claim 1, wherein the collection means are located on a wafer of the device on which said optical guiding plane ends.

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          7. Test device according to claim 1, wherein the excitation is a light beam and in that the collection means comprise means for filtering the excitation light beam.

15           8. Test device according to claim 1, wherein it comprises several sample reception sites.

          9. Test device according to claim 1, wherein it is formed from a silicon substrate successively coated with a first layer of silicon oxide, a layer of silicon nitride acting as optical guiding plane and a second layer of silicon oxide in which is formed the site for receiving the sample.

20           10. Test device according to any of claims 1 to 9, wherein the sample is a biological sample chosen from among a micro-organism such as a bacteria, a fungus, a virus, a chemical compound, a healthy or tumorous cell, a molecule such as a peptide, a protein, an enzyme, a polysaccharide, a lipid, a lipoprotein, a nucleic acid, a hormone, an antigen, an antibody, a growth factor, or a hapten.

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